



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,491	01/16/2007	Vesa Myllymaki	0696-0240PUS1	3826
2292 7590 02/13/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
BLAND, LAYLA D				
ART UNIT		PAPER NUMBER		
1623				
NOTIFICATION DATE		DELIVERY MODE		
02/13/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/581,491

Applicant(s)

MYLLYMAKI ET AL.

Examiner

LAYLA BLAND

Art Unit

1623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 17, 2008 has been entered.

This Office Action is in response to Applicant's request for continued examination (RCE) filed November 17, 2008, and response to the Final Office Action (mailed June 28, 2008), filed October 17, 2008.

Claims 1-19 are pending and are examined on the merits herein.

The following is a new rejection:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graenacher (US 1,943,176, January 9, 1934, PTO-1449 submitted June 2, 2006) in view of Swatloski et al. (WO 03/029329, April 10, 2003, PTO-1449 submitted August 29, 2006), Takaragi et al. (Cellulose 6: 93-102, 1999), and Brandt et al. (Ullmann's

Encyclopedia of Chemical Technology, Vol. 2, pp 221-234 (2001), PTO-1449 submitted December 5, 2006).

Greaenacher teaches that liquid quaternary ammonium salts dissolve cellulose [page 1, lines 5-10]. Benzyl-pyridinium chloride [page 1, Example 1] and ethyl-pyridinium chloride [page 2, Example 5] are exemplified. The cellulose solutions are suitable for chemical reactions such as etherification or esterification and the cellulose derivatives can be separated from the solution by means of precipitating agents [page 1, lines 29-51] such as water [page 2, Example 7]. Etherification in the presence of pyridine (an organic base) is exemplified [page 3, Example 14].

Greaenacher does not exemplify the quaternary ammonium salts shown in claims 6 and 7, and teaches etherification of cellulose in the presence of an organic base, not an inorganic base.

Swatloski teaches that the efficiency of previously existing methods for dissolving and derivatizing cellulose can be significantly improved by the availability of suitable solvent [page 3, second paragraph]. Swatloski et al. teach the dissolution of cellulose in ionic liquids using microwave heating [page 19, first full paragraph]. Ionic liquids comprising chloride anions and imidazolium cations were most effective [page 29, last two paragraphs]. Exemplary ionic liquid cations, molten at a temperature of less than about 150°C [pages 10 and 11], include the cations shown in claims 5-7 of the instant application. Cellulose can be dissolved for derivatization [page 18, last sentence] and regenerated in a number of forms from the solution by mixing with water, ethanol, or acetone [page 28, first full paragraph].

Takaragi et al. teach etherification of cellulose in non-aqueous solvent systems such as LiCl/DMAc [page 93, Introduction] and LiCl/DMI [page 94, first paragraph]. O-methylcellulose was prepared in LiCl/DMI using finely powdered NaOH and methyl iodide and the products were recovered by precipitation into excess methanol [page 95, first paragraph].

Brandt et al. teach etherification of cellulose using R-X compounds such as methyl chloride or sodium chloroacetate, epoxides, acrylic compounds, or diazoalkanes in the presence of OH⁻ [page 463, reaction equations]. In the case of lower alkyl chlorides or epoxides, the reaction is carried out in autoclaves at a pressure of about 3 MPa [page 467, 2.3].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the etherification of cellulose in the ionic liquid solvents taught by Greanacher and Swatloski et al., and in the presence of inorganic base and etherifying agents as taught by Takaragi et al. and Brandt et al. Derivatization of cellulose using alkyl halide in ionic liquid is known in the art, as taught by Greanacher. A number of ionic liquids which are appropriate for dissolving and derivatizing cellulose are known in the art, as taught by Swatloski et al. The use of inorganic base and the recited etherification reagents for etherification of cellulose is also known in the art, as taught by Takaragi et al. and Brandt et al. Thus, the skilled artisan could carry out the etherification of cellulose in the ionic liquids taught by Greanacher or Swatloski, and could use reagents which are already known in the art for etherification of cellulose, as taught by Takaragi and Brandt.

Response to Arguments

Applicant's arguments are moot in view of the new ground of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAYLA BLAND whose telephone number is (571)272-9572. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anna Jiang can be reached on (571) 272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shaojia Anna Jiang/
Supervisory Patent Examiner, Art Unit 1623

/Layla Bland/
Examiner, Art Unit 1623